



US-India Energy Cooperation

Keeping Gas on the Agenda

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Topline statistics suggest that natural gas is a marginal but growing energy source in India; about 6 percent of India's power generation today comes from natural gas, and current government plans target a level of 15 percent by 2030.¹ Meanwhile, roughly 10 percent of India's industry sector direct energy use—a key future use case—is now met through natural gas, up from just 2 percent in 2010.² In addition, half of India's gas supply is now imported through its six liquefied natural gas (LNG) import terminals, making it the fourth-largest LNG buyer globally, and four more terminals are currently under construction to expand capacity and access.³ Meanwhile, India's domestic gas pipeline network has grown by half within the past decade, from approximately 14,000 kilometers (8,700 miles) in 2014 to 22,000 kilometers (13,700 miles) in 2022.⁴

In parallel, however, these trends are undercut by a sense of ambivalence toward gas's role in India's rapidly expanding energy system. While dispatchable natural gas-fired power could be well suited as a complement to India's breakneck growth in intermittent renewable power, today a number of such plants—approximately half of the installed capacity of twenty-five gigawatts, many of them privately owned—sit idle given the cost of gas compared to coal. Although fuel switching from coal to natural gas is arguably the most cost-effective medium-term method for reducing both local pollution and carbon emissions for industrial sector heat needs—and India is already the world's third-largest producer of steel and second-largest producer of cement—a still quite restricted gas pipeline network limits industrial access. Perhaps half of India's modern steel plants, for example, are located in the coal-rich inland or eastern regions, while LNG terminals and distribution networks are clustered in the west.⁵

And while India arguably has untapped economic natural gas resources both domestically (e.g., the Bay of Bengal) and among near neighbors at pipeline distances—including Bangladesh or even Iran—India's domestic gas production, onshore and off, is flat or declining and has suffered from years of underinvestment stemming in large part from an artificially low domestic gas pricing mechanism. There are no plans for pipeline importation, either,

which could offer the next best chance for new gas supplies at prices competitive with coal. This domestic underinvestment has benefitted LNG imports, but LNG's even higher cost has in turn pigeonholed the fuel.⁶

Gas sits in limbo within a "smile curve" energy strategy, which aims to meet massive supply and demand growth given a rapidly growing Indian middle class. At one end of that curve lie aggressive domestic deployment plans for five hundred gigawatts capacity of zero-carbon renewables or nuclear by 2030, and subsidies for the domestic production of green hydrogen, produced through electrolysis, at about five times the cost of natural gas, presumably for industrial use once scaled. At the other end of the curve, coal remains the dominant fuel, and growth in demand is likely to continue for another decade. This is quite understandable, given the price sensitivity of the sector and the importance of meeting growth in India's electricity consumption

But India is not alone. In the United States, too, moderately clean natural gas struggles with a similar policy contradiction, despite the United States' considerable resource endowment and huge growth in production and consumption over the past fifteen years. On one hand this continues to enable the country's economic competitiveness as the marginal price-setter on most regional electric grids, displacing coal. It also serves as a key input to industries, including its enabling of \$100 billion in chemicals manufacturing since 2010.⁷ The US is currently the world's largest LNG exporter and in 2022 more than doubled exports to Europe due to war shortages. On the other hand, gas transmission and distribution face increasing public pressure from US civil society and environmental groups; US officials press for policies to limit multilateral development bank funding for gas infrastructure projects; and the US diplomatic voice on the fuel has been too quiet in key regional diplomatic fora, such as the Quadrilateral Security Dialogue (the Quad), favoring instead zero-carbon technologies.

Any sustainable energy strategy must balance three concerns: (1) the economics and affordability of energy and fuel choices; (2) the attendant environmental impacts; and (3) the security and reliability of the system. The role of natural gas in India is arguably held back today by concerns about the first leg of that stool—affordability—while concerns today in the United States hinge on the second—the environment (mostly climate). And particularly following the disruptions in the global gas market of 2022, the two countries arguably should have new, shared interests in strengthening the third leg of regional gas security.

None of these three concerns as they pertain to gas are easily solved, and policy priorities in both countries may simply be to focus efforts and investment elsewhere, rather than taking on these challenges. And the United States and India have shared a range of historical experiences on commercial oil and gas investment. But given the need to balance each leg of the energy policy stool, and the uneven progress of credible substitute energy technologies, the key future role that will be played by gas is underappreciated in both countries. Both would be well served by a more serious policy focus on the fuel today.

Given current trends, if the United States and India were to actively use their common underlying interest in gas as a platform for further bilateral engagement, what are some collective steps that they might take to mitigate concerns across each of these three areas and help keep a place for this flexible, if imperfect, fuel on their shared energy agenda?

GAS AFFORDABILITY

Globally, since the Russian invasion of Ukraine and ensuing pipeline shutdowns, the natural gas market has entered a period of chaos akin to what the international oil market faced during the Arab oil embargoes of the 1970s. That market is likely to remain tight over the next three to five years, with associated sharp swings in prices. Asia today represents about four-fifths of global LNG demand but less than two-fifths of global production. And as market attention turns toward European buyers with high willingness to pay following Russian supply interruptions, there is significant interest from Indo-Pacific countries in ensuring affordable access to their traditional supplies, and in strengthening the regional supply chain to be more resilient against the next global gas crisis. In 2022, for example, Asian LNG cargoes were diverted to Europe as spot prices soared and the fuel became uncompetitive with domestic resources.⁸ LNG imports through midyear were down 16 percent in India, 21 percent in China, and 15 percent in Pakistan.⁹

The most important solution to gas affordability in India would be to modernize pricing regulation through measures such as the 2014 reforms, which linked Indian domestic gas prices to an international basket of extremely efficient domestic gas producers including the United States, Canada, Russia, and Europe. This effectively discouraged further investment in domestic production. While India may not have the apparent overall gas resource that was unlocked by fracking in the United States, a similar deregulatory approach that encourages creativity and investment by numerous upstream players could be transformational. The underperformance of Indian domestic gas production compared to expectations is more about policy than about geology. And with reforms, US technologies and oilfield service firms might play a larger role in the economic development of this resource.

Separately, although India has made laudable past efforts toward pipeline gas imports from its neighbors, all failed because of complex domestic and regional politics. Is it time to revisit such efforts with the goal of reducing the costs of India's gas imports—including the promising Myanmar-Bangladesh-India pipeline of the mid-2000s—which instead now flow to China, bypassing the Malacca Strait?¹⁰ With broader US-Myanmar relations at an apparent impasse, despite an ongoing interest in limiting China's growing influence in the country, India's engagement on such an effort may offer dividends.

Meanwhile, one way that the United States could unilaterally help on the global LNG affordability front, particularly in a world without Russian pipeline gas, is simply by growing the pie. While little more can be done in the short term, the United States has substantial headroom to increase natural gas production and LNG exports over the medium term. One industry

estimate, for example, suggests that the US Appalachian Marcellus Shale and the Permian Basin resources could support an additional fifty billion cubic feet per day over thirty years at a price of \$3.75 per mmbtu, for a roughly 50 percent total production increase.¹¹ US domestic permitting reform, underpinned by a social license to operate based upon improved environmental performance, and global demand certainty amidst a market moving toward greater liquidity rather than fixed contracts, would be a key enabler of such a production increase.

GAS AND THE ENVIRONMENT

While coal-to-gas fuel switching in the United States power sector over the past fifteen years—roughly 49 percent of power generation from coal and 20 percent from gas in 2007 to 40 percent gas and 20 percent coal in 2022—has been the largest source of the country’s carbon emissions reductions, gas’s environmental footprint in the United States has come under increasing scrutiny.¹² Methane leakage from gas systems across the upstream, midstream, and downstream levels has drawn particular attention.¹³ But a combination of new technologies such as remote sensors, and business models including data fusion services, now offer the potential for a more transparent “well-to-flame” regional LNG supply chain. This could make for a particularly compelling environmental argument where it could be shown that a cleaner US gas supply chain was displacing competing gas imports from comparatively methane-emission-intensive Russian or Iranian supplies.¹⁴

India could work with the United States to simultaneously address leakage in US upstream operations with leak detection and efficiency of use in the downstream portions of the gas system to create a trusted, clean LNG supply chain. Quad partners Japan (a major gas buyer) and Australia (a major gas seller) could also join. Helpfully, this potential area of cooperation has begun to receive attention in both multilateral fora, such as the May 2022 Quad Joint Leaders’ Statement in Tokyo, and bilateral contexts, such as the US-India Strategic Clean Energy Partnership’s responsible oil and gas pillar, implemented through the US Department of Energy.¹⁵ In doing so, the US side should be sensitive to the different priorities that US and Indian gas supply chain participants and regulators may place on emissions performance versus cost.

Combining such efforts with an improved ability to clearly show that US gas was displacing coal use for power generation or industry among buyers abroad, such as India, would ultimately help support industry’s social license to operate in the United States and to invest in globally needed new export infrastructure. Better comprehensive Indian energy data here might support that argument. India today lacks a centralized energy statistical agency akin to the US Department of Energy’s Energy Information Administration, instead relying on a patchwork of databases of varying quality and assumptions, maintained by a variety of responsible ministries. The United States and India could jointly work to overcome the barriers to creating a modern Indian Energy Information Administration that could improve transparency and be a foundation for further energy policy analysis by a variety of skilled Indian domestic civil society organizations that have become internationally active in this area.¹⁶

REGIONAL GAS SECURITY

More stockpiling and strategic reserves could help mitigate the risks of future gas supply disruptions.¹⁷ India imports 80 percent of its oil and has a strategic petroleum reserve representing about ten days of current consumption.¹⁸ But on natural gas, where imports represent just over half of total supply, India lacks a strategic reserve, though in fall of 2022 it announced the initial development of one.¹⁹ More robust strategic reserves could serve both India's own needs in case of geopolitical shocks and the broader functioning of the global market, including emerging importers in the Global South.

While natural gas storage can be five to ten times more expensive than storing oil, even a modest degree of gas storage can help with seasonal energy demand needs and serve as a hedge against pipeline or LNG import disruption. Physical storage can also help to facilitate development of a gas trading hub, which India lacks, and to buffer market prices. It could therefore be seen as a step toward gas tariff reforms. One area where the United States may be helpful here is in sharing its substantial experience and expertise in underground gas storage, which can be significantly cheaper than the LNG tankerage more typically used in Asia. Whereas it is common to have multimonth underground gas storage for seasonal heating needs in the United States or Europe, Asia represents only about 1 percent of the world's total geologic storage.²⁰ Typically, underground gas storage relies on the use of depleted oil or gas reservoirs, but gas can also be stored in aquifers or salt caverns.²¹ The United States and India should cooperate to this end on geologic mapping, on exploring offshore storage potential, or on joint research on the use of less conventional storage methods for gas, such as abandoned mine shafts.

Beyond domestic capabilities, the United States and India could also work together to establish a joint regional gas storage, data, and coordinated drawdown mechanism, along the lines of the oil stockpiling and coordination standards created under the Organisation for Economic Co-operation and Development's International Energy Agency (IEA) in the 1970s. No such multilateral agreement for gas currently exists today, in the Indo-Pacific or elsewhere. This could include joint standards for natural gas storage, where there is a particular collective-action benefit, and more work on regional gas market data sharing among interested partners.

Finally, as risk profiles shift from a traditional concern with geopolitical disruption among fuel suppliers out of the region (e.g., the Middle East) to potential disruptions within the Indo-Pacific region itself, the United States and India could fruitfully cooperate on the security of basin LNG shipping logistics and crisis planning. This includes more attention to who owns ships, who owns ports, and who insures them, to understand how any player could be diplomatically pressured in a conflict. It could also include joint crisis planning and tabletop exercises on LNG or pipeline disruptions. This could involve the Quad countries, which include both major regional buyers and sellers of LNG, and their potential interaction and impacts on regional economies.

In sum, a future role for gas within India's energy transformation is underappreciated. And the United States, despite its own somewhat contradictory stance toward the fuel, has something to bring to the table in this process, should it choose to do so as part of its diplomatic and global security policy portfolio. Energy is an underused platform for broader US-India engagement, with a rich menu of options on it to collectively explore. Gas should be on that agenda.

NOTES

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